

PATENT COOPERATION TREATY

PCT


INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 26 SEP 2005

WIPO PCT

Applicant's or agent's file reference 03/0043WO1		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/US2004/023028		International filing date (day/month/year) 25.06.2004		Priority date (day/month/year) 26.06.2003
International Patent Classification (IPC) or national classification and IPC C07C51/48, C07C59/01, C07C57/04				
Applicant CARGILL, INCORPORATED et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 08.06.2005		Date of completion of this report 23.09.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer: Bertrand, F Telephone No. +49 89 2399-8606		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/023028

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-17 as originally filed

Claims, Numbers

1-17 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-17
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

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Re Item I

Basis of the report

The documents mentioned herein are numbered in accordance with the order they appear in the International Search Report.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The present application appears to validly enjoy priority rights from the filing date of the priority document. The documents indicated in the international search report as E (see Item VI, certain documents cited) could be relevant to assess whether the present claims satisfy the criteria set forth in Article 33(2) PCT in the regional/national phases.

It should be noted that D1 claims the same priority date than the present application, but belongs to the same applicant. In some regional/national phases, a double-patenting is not allowed. However, D1 solely relates to the extraction with the presently disclaimed EtOAc.

D3 relates to the recovery of 3HP by distillation with dodecanol.

D2 relates to the recovery of AA from an aqueous phase by extraction with an organic solvent, 3HP not being mentioned in D2.

Novelty (Art.33(2)PCT) of the present claims 1-17 is thus formally given.

In the light of the applicant's submissions in response to the opinion of the ISA, the following must be considered for lack of inventive step (Art.33(3)PCT):

The present application seems to be concerned with the separation of 3-hydroxypropionic acid (3HP) from acrylic acid (AA). However, this is not reflected in the present claims 8-13 which relate to a mixture containing AA with or without 3HP and along with any other possible compounds.

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If the technical problem underlying the present claims 8-13 is to be understood as providing a method for obtaining pure AA, it is not credible that a suitable separation can be achieved by the claimed process with any of such mixtures, especially in the presence of compounds being more water soluble than AA.

If the technical problem relates to the separation of a part of AA from less water soluble compounds, the extraction with water is obvious. Further, the removal - e.g. by distillation - of the organic solvent for displacing the compound to be extracted into water is a routine measure for the skilled artisan, especially when the said compound has a non-negligible solubility in the said organic solvent. Furthermore, it is well known in the art to extract acids from an organic phase with water by further adding a base because the acid salts are more water soluble. Such an addition of base is not excluded from the present claims 8-13.

AA and 3HP have respectively the known partition coefficients of 0.35 and -0.89 (given as logP octanol/water, as found in customary handbooks). Therefore, 3HP is known to be about 17 times more water-soluble than AA. The skilled artisan facing the problem to separate both acids present in a single aqueous solution would contemplate extracting the less water soluble i.e. AA with an organic solvent. The use of a low-boiling extractant is obvious for reasons of ease of recovery of AA, either as solid or as an aqueous solution. The subject-matter of the present claims 1-7 is thus obvious.

The subject-matter of the present claims 14-17 consists of the successive use of the step according to the present claims 1-7 followed by the step according to the present claims 8-13. Both steps being obvious and the present claims 14-17 relating to a juxtaposition rather than to a combination thereof, the subject-matter of the said claims 14-17 is obvious.

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO 2005/003074	13.01.2005	25.06.2004	26.06.2003

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PCT/US2004/023028

WO 2004/076398

10.09.2004

24.02.2004

24.02.2003